

Ontario. Cottage Pollution
Control Program.

1970 Cottage Pollution Control
Program : Bass Lake.

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ONTARIO DEPARTMENT OF HEALTH
ONTARIO WATER RESOURCES COMMISSION
1970 COTTAGE POLLUTION CONTROL PROGRAM

BASS LAKE



As a result of recommendations contained in the March, 1970 report on Environmental Management of Recreational Waters in Cottage Areas in Ontario, water quality surveys of Bass Lake located in the County of Simcoe were conducted by staff of the Ontario Water Resources Commission's District Engineers Branch during the periods of July 5 to 9 and September 24 to 27, 1970. Staff of the Ontario Department of Health's Public Health Engineering Service had performed investigations of the on-shore private sewage disposal systems prior to 1970, and corrections to the faulty systems are underway.

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The bacteriological results (see appended map), which were evaluated statistically by the OWRC's Bacteriology Branch, show that the total coliform and fecal coliform geometric mean densities during both survey periods generally met the OWRC bacteriological criteria for total body contact recreational use. The exceptions occurred during the September survey when the total coliform content did not meet the OWRC criteria at Stations 17 and 18 along the west shore. These high contents were probably due to a nearby stream inflow.

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The fecal streptococcus results did not meet the OWRC criteria at many stations during both surveys. These high results may be attributed to natural animal populations in the lake itself and the streams entering the lake along the south-west shore.

The dissolved oxygen content in the surface waters was above the minimum level designated by the OWRC for the preservation of warm water organisms. The sharp decline in dissolved oxygen content near the bottom is attributed to the decomposition of settled organic matter on the lake bottom.

No thermal stratification of the lake waters was observed during each survey. Although stratification is a natural occurrence in many lakes, wind action coupled with lake morphometry and a shallow depth probably caused mixing of surface and bottom waters, thereby breaking down any stratification before it could be established.

The chemical quality of the lake waters was found to be generally satisfactory. The hardness was generally between 138 and 142 ppm, which approximates that of Lake Ontario.

BACTERIOLOGICAL INDICATOR ORGANISMS

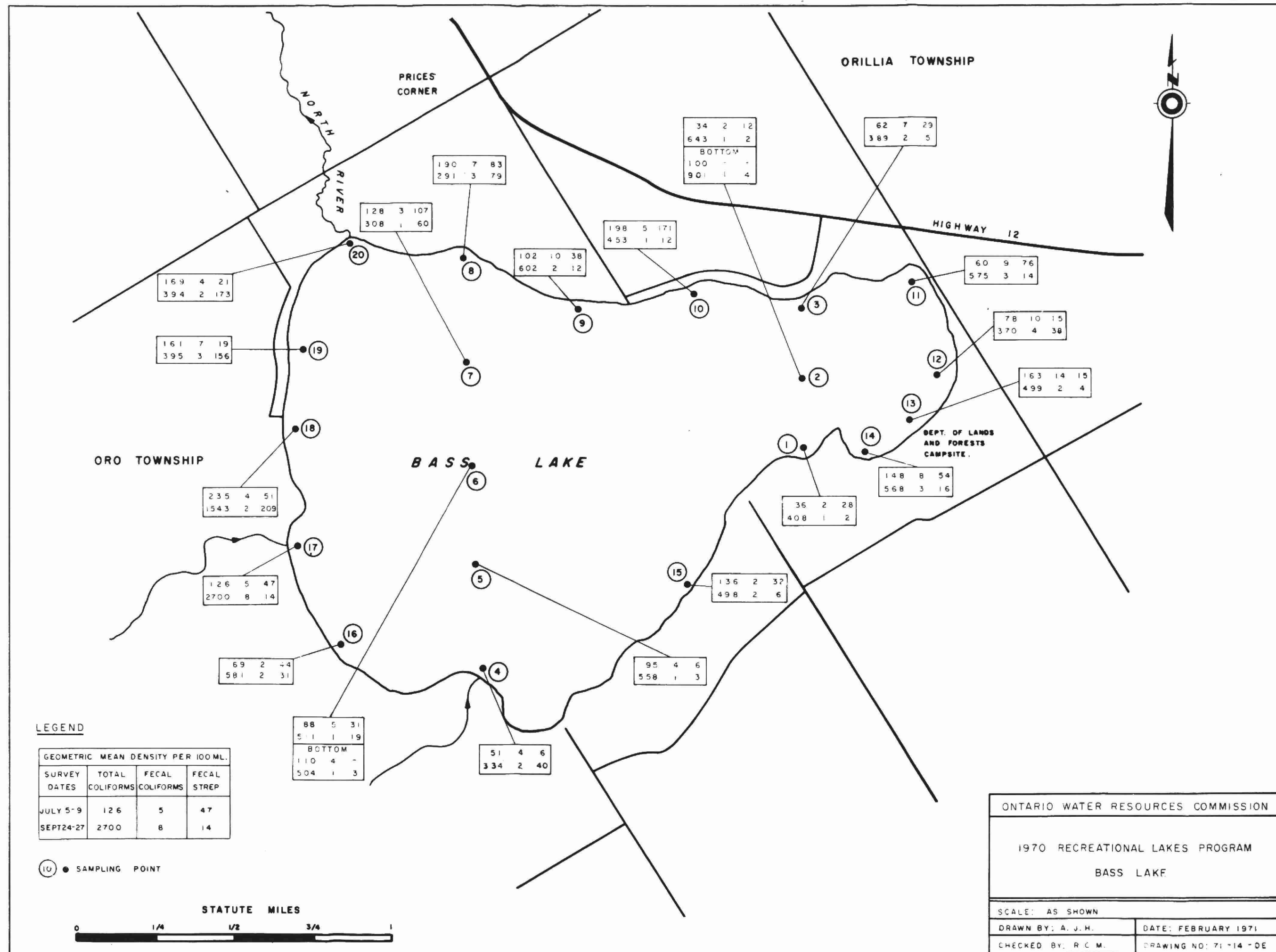
TOTAL COLIFORM organisms include a wide variety of bacteria ranging from the genus (group) Escherischia Coli (E. coli), which originate mainly in the intestines of man and other warm blooded animals, to the genera Citrobacter and Enterobacter aerogenes. The latter genera are basically found in soil but are also present in feces in small numbers. The presence of total coliforms in water may indicate soil run-off or, more important, less recent fecal pollution since organisms of the Enterobacter - Citrobacter groups tend to survive longer in water than do members of the Escherischia Coli group, and even to multiply when suitable environmental conditions exist.

The FECAL COLIFORM organisms are those coliform bacteria which are of intestinal origin and, therefore, are an indicator of recent fecal pollution. Most of the coliform bacteria found by the fecal coliform test are of the genus Escherichia Coli.

FECAL STREPTOCOCCI organisms are normal inhabitants of the large intestine of man and animals and generally do not multiply outside the human body. In waters polluted with fecal material, fecal streptococci are usually found along with fecal coliform bacteria but in smaller numbers. When the number of fecal streptococci bacteria approximates or is greater than the number of fecal coliform organisms, animals are the probable source.

The OWRC Guidelines and Criteria for Water Quality Management in Ontario (1970) indicate that water used for total body contact recreation can be considered impaired when the total coliform, fecal coliform, and/or fecal streptococcus geometric mean density exceeds 1000,100, and/or 20 per 100 ml, respectively.

NOTE: The term "geometric mean" refers to a type of average. Mathematically speaking, the geometric mean of a set of N numbers is the Nth root of the product of the numbers; in practice, it is computed by the use of logarithms.





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